



# WTB9M4L-3P2291

W9

PHOTOELECTRIC SENSORS

**SICK**  
Sensor Intelligence.



### Ordering information

| Type           | part no. |
|----------------|----------|
| WTB9M4L-3P2291 | 1058224  |

Other models and accessories → [www.sick.com/W9](http://www.sick.com/W9)

Illustration may differ



### Detailed technical data

#### Features

|  |   |
|--|---|
| <b>Functional principle</b>            | Photoelectric proximity sensor                                |
| <b>Functional principle detail</b>     | Background suppression  |
| <b>Dimensions (W x H x D)</b>          | 12.2 mm x 49.8 mm x 23.6 mm                                   |
| <b>Housing design (light emission)</b> | Rectangular   |
| <b>Mounting hole</b>                   | M4  |
| <b>Sensing range max.</b>              | 25 mm ... 400 mm <sup>1)</sup>                                |
| <b>Sensing range</b>                   | 25 mm ... 400 mm <sup>1)</sup>                                |
| <b>Type of light</b>                   | Visible red light   |
| <b>Light source</b>                    | Laser <sup>2)</sup>   |
| <b>Light spot size (distance)</b>      | Ø 0.9 mm (230 mm)   |
| <b>Wave length</b>                     | 650 nm  |
| <b>Laser class</b>                     | 2 (IEC 60825-1 / CDRH 21 CFR 1040.10 & 1040.11) <sup>3)</sup> |
| <b>Adjustment</b>                      | Potentiometer, 5 turns  |
| <b>Special applications</b>            | Detecting small objects                                       |

<sup>1)</sup> Object with 90% remission (based on standard white, DIN 5033).

<sup>2)</sup> Average service life: 50,000 h at T<sub>U</sub> = +25 °C.

<sup>3)</sup> Do not intentionally look into the laser beam. Never point the laser beam at people's eyes.

## Mechanics/electronics

|   |   |
|---|---|
| <b>Supply voltage <math>U_B</math></b>        | 10 V DC ... 30 V DC <sup>1)</sup>                     |
| <b>Ripple</b>                                 | < 5 V <sub>pp</sub> <sup>2)</sup>                     |
| <b>Current consumption</b>                    | 30 mA <sup>3)</sup>                                   |
| <b>Switching output</b>                       | PNP <sup>4)</sup>                                     |
| <b>Output function</b>                        | Complementary   |
| <b>Switching mode</b>                         | Light/dark switching <sup>4)</sup>                    |
| <b>Output current <math>I_{max}</math></b>    | ≤ 100 mA  |
| <b>Response time</b>                          | ≤ 1 ms <sup>5)</sup>                                  |
| <b>Switching frequency</b>                    | 500 Hz <sup>6)</sup>                                  |
| <b>Connection type</b>                        | Male connector M8, 4-pin                              |
| <b>Circuit protection</b>                     | A <sup>7)</sup><br>B <sup>8)</sup><br>C <sup>9)</sup> |
| <b>Protection class</b>                       | III   |
| <b>Weight</b>                                 | 13 g  |
| <b>Housing material</b>                       | Plastic, VISTAL®                                      |
| <b>Optics material</b>                        | Plastic, PMMA   |
| <b>Enclosure rating</b>                       | IP66<br>IP67<br>IP69K                                 |
| <b>Ambient operating temperature</b>          | -10 °C ... +50 °C                                     |
| <b>Ambient operating temperature extended</b> | -30 °C ... +55 °C <sup>10) 11)</sup>                  |
| <b>Ambient temperature, storage</b>           | -30 °C ... +70 °C                                     |
| <b>UL File No.</b>                            | NRKH.E181493  |

<sup>1)</sup> Limit values when operated in short-circuit protected network: max. 8 A.

<sup>2)</sup> May not fall below or exceed  $U_V$  tolerances.

<sup>3)</sup> Without load.

<sup>4)</sup> Q = light switching.

<sup>5)</sup> Signal transit time with resistive load.

<sup>6)</sup> With light/dark ratio 1:1.

<sup>7)</sup> A = V<sub>S</sub> connections reverse-polarity protected.

<sup>8)</sup> B = inputs and output reverse-polarity protected.

<sup>9)</sup> C = interference suppression.

<sup>10)</sup> As of T<sub>a</sub> = 50 °C, a max. supply voltage V<sub>max.</sub> = 24 V and a max. load current I<sub>max.</sub> = 50 mA is permitted.

<sup>11)</sup> Operation below T<sub>u</sub> -10 °C is possible if the sensor is already switched on at T<sub>u</sub> > -10 °C, then cools down, and the supply voltage is subsequently not switched off. Switching on below T<sub>u</sub> -10 °C is not permissible.

## Safety-related parameters

|                         |  |
|-------------------------|--|
| <b>MTTF<sub>D</sub></b> | 424 years (EN ISO 13849-1) <sup>1)</sup> |
| <b>DC<sub>avg</sub></b> | 0 %                                      |

<sup>1)</sup> Mode of calculation: Parts-Count-calculation.

## Certificates

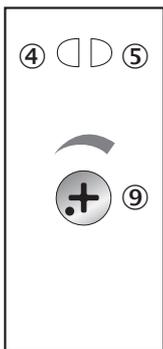
|                                     |   |
|-------------------------------------|---|
| <b>EU declaration of conformity</b> | ✓ |
| <b>UK declaration of conformity</b> | ✓ |

|   |   |
|---|---|
| <b>ACMA declaration of conformity</b>         | ✓ |
| <b>Moroccan declaration of conformity</b>     | ✓ |
| <b>China RoHS</b>                             | ✓ |
| <b>ECOLAB certificate</b>                     | ✓ |
| <b>cULus certificate</b>                      | ✓ |
| <b>Laser safety (IEC 60825-1) certificate</b> | ✓ |

### Classifications

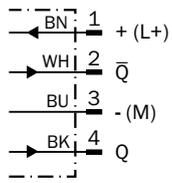
|                       |          |
|-----------------------|----------|
| <b>ECLASS 5.0</b>     | 27270904 |
| <b>ECLASS 5.1.4</b>   | 27270904 |
| <b>ECLASS 6.0</b>     | 27270904 |
| <b>ECLASS 6.2</b>     | 27270904 |
| <b>ECLASS 7.0</b>     | 27270904 |
| <b>ECLASS 8.0</b>     | 27270904 |
| <b>ECLASS 8.1</b>     | 27270904 |
| <b>ECLASS 9.0</b>     | 27270904 |
| <b>ECLASS 10.0</b>    | 27270904 |
| <b>ECLASS 11.0</b>    | 27270904 |
| <b>ECLASS 12.0</b>    | 27270903 |
| <b>ETIM 5.0</b>       | EC002719 |
| <b>ETIM 6.0</b>       | EC002719 |
| <b>ETIM 7.0</b>       | EC002719 |
| <b>ETIM 8.0</b>       | EC002719 |
| <b>UNSPSC 16.0901</b> | 39121528 |

### Adjustments possible Potentiometer

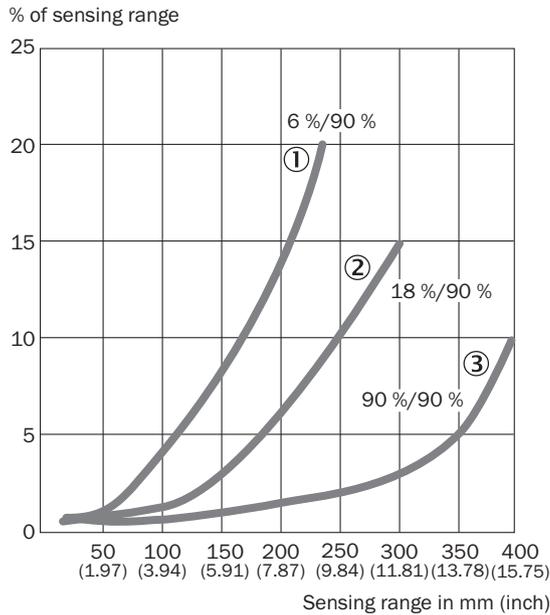


- ④ LED indicator yellow: Status of received light beam
- ⑤ LED indicator green: power on
- ⑨ Adjustment of sensing range

Connection diagram Cd-083



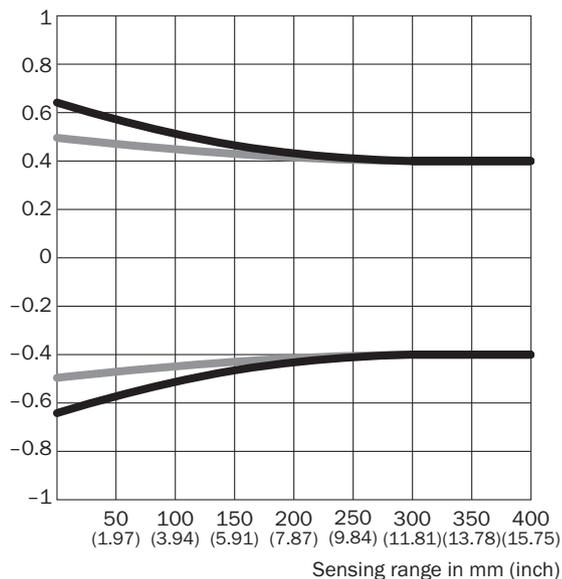
Characteristic curve WTB9L-3, laser class 2



- ① Sensing range on black, 6% remission factor
- ② Sensing range on gray, 18% remission factor
- ③ Sensing range on white, 90% remission factor

### Light spot size WTB9L-3, laser class 2

Radius in mm (inch)

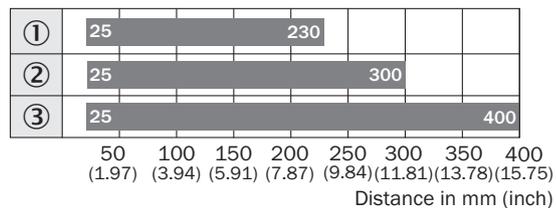


#### Dimensions in mm (inch)

| Sensing range                   | Vertical      | Horizontal    |
|---------------------------------|---------------|---------------|
| <b>50 mm</b><br><b>(1.97)</b>   | 1.2<br>(0.05) | 1.0<br>(0.04) |
| <b>100 mm</b><br><b>(3.94)</b>  | 1.1<br>(0.04) | 1.0<br>(0.04) |
| <b>200 mm</b><br><b>(7.87)</b>  | 0.9<br>(0.04) | 0.9<br>(0.04) |
| <b>400 mm</b><br><b>(15.75)</b> | 0.8<br>(0.03) | 0.8<br>(0.03) |

— Vertical  
— Horizontal

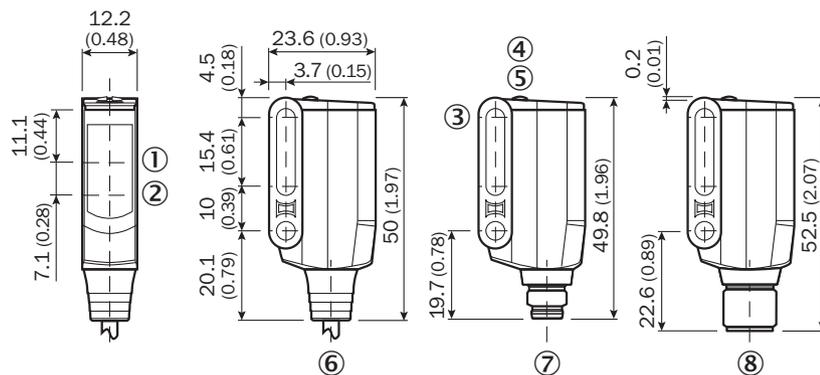
### Sensing range diagram WTB9L-3, laser class 2



■ Sensing range typ. max.

- ① Sensing range on black, 6% remission factor
- ② Sensing range on gray, 18% remission factor
- ③ Sensing range on white, 90% remission factor

### Dimensional drawing WTB9M4L-3



Dimensions in mm (inch)

- ① Center of optical axis, receiver
- ② Center of optical axis, sender
- ③ Mounting hole M4 (Ø 4.1 mm)
- ④ LED indicator yellow: Status of received light beam
- ⑤ LED indicator green: power on
- ⑥ Connecting cable or connecting cable with connector
- ⑦ male connector M8, 4-pin
- ⑧ male connector M12, 4-pin

## Recommended accessories

Other models and accessories → [www.sick.com/W9](http://www.sick.com/W9)

|   | Brief description  | Type               | part no. |
|---|--|--------------------|----------|
| <b>Mounting systems</b>   |  |                    |          |
|    | <ul style="list-style-type: none"> <li>• <b>Description:</b> Plate N08 for universal clamp bracket</li> <li>• <b>Material:</b> Steel, zinc diecast</li> <li>• <b>Details:</b> Zinc plated steel (sheet), Zinc die cast (clamping bracket)</li> <li>• <b>Items supplied:</b> Universal clamp (5322626), mounting hardware</li> <li>• <b>Usable for:</b> W100, W150, W4S, W4F, W8, W9-3, W8G, W8 Laser, W8 Inox, G6, W100 Laser, W100-2, W10, G6 Inox, RAY10, W4SLG-3, W9, GR18, MultiPulse, Reflex Array, MultiLine, LUT3, KT5, KT8, KT10, CS8</li> </ul> | BEF-KHS-N08        | 2051607  |
|    | <ul style="list-style-type: none"> <li>• <b>Description:</b> Mounting bracket</li> <li>• <b>Material:</b> Steel</li> <li>• <b>Details:</b> Steel, zinc coated</li> <li>• <b>Items supplied:</b> Mounting hardware included</li> <li>• <b>Suitable for:</b> W9-3</li> </ul>   | BEF-WN-W9-2        | 2022855  |
|  | <ul style="list-style-type: none"> <li>• <b>Description:</b> Plate N11N for universal clamp bracket</li> <li>• <b>Material:</b> Stainless steel</li> <li>• <b>Details:</b> Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp)</li> <li>• <b>Items supplied:</b> Universal clamp (5322627), mounting hardware</li> <li>• <b>Usable for:</b> DeltaPac, Glare, WTD20E</li> </ul>  | BEF-KHS-N11N       | 2071081  |
| <b>connectors and cables</b>  |  |                    |          |
|  | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M8, 4-pin, straight, A-coded</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Sensor/actuator cable</li> <li>• <b>Cable:</b> 5 m, 4-wire, PVC</li> <li>• <b>Description:</b> Sensor/actuator cable, unshielded</li> <li>• <b>Application:</b> Uncontaminated zones, Zones with chemicals</li> </ul>   | YF8U14-050VA3XLEAX | 2095889  |
|  | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Male connector, M8, 4-pin, straight, A-coded</li> <li>• <b>Description:</b> Unshielded</li> <li>• <b>Connection systems:</b> Screw-type terminals</li> <li>• <b>Permitted cross-section:</b> 0.14 mm² ... 0.5 mm²</li> </ul>   | STE-0804-G         | 6037323  |
|  | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M8, 4-pin, straight, A-coded</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Sensor/actuator cable</li> <li>• <b>Cable:</b> 5 m, 4-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Sensor/actuator cable, unshielded</li> <li>• <b>Application:</b> Drag chain operation, Zones with oils and lubricants, Robot, Drag chain operation</li> </ul>  | YF8U14-050UA3XLEAX | 2094792  |

## SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is “Sensor Intelligence.”

## WORLDWIDE PRESENCE:

Contacts and other locations –[www.sick.com](http://www.sick.com)